FIG. 3 is an elevation plan view of another embodiment of a wiper according to the present invention;

FIG. 4 is an elevation plan view of yet another embodiment of a wiper according to the present invention; and

FIG.5 is a view taken along line 5-5 in FIG. 4.

While the invention has been illustrated and will hereinafter be described in detail in connection with certain potentially preferred embodiments and practices, it is to be understood that the foregoing general description as well as the following detailed description and accompanying drawings are exemplary and explanatory only and in no event is the invention intended to be limited thereby. On the contrary, it is intended that the present invention shall extend to all alternatives, modifications and equivalents as may embrace the broad principles of this invention within the true spirit and scope thereof.

DESCRIPTION OF PREFERRED EMBODIMENTS

Reference will now be made to the drawings, wherein to the extent possible, like elements are designated by like reference numerals throughout the various views. All of the United States patents cited within the specification are hereby incorporated by reference in their entirety as if fully set forth herein.

According to the potentially preferred practice, the wipers of the present invention may be constructed from a multiplicity of woven or knitted yarns of polyester fiber, preferably fibers of poly(ethylene terephthalate).

Such yarn is preferably a continuous filament polyester yarn although other yarn types and constructions may likewise be utilized if necessary. It is contemplated that yarns having a wide variety of denier and filament count characteristics may be employed. Examples of useful yarns may include those having a denier to filament ratio of about 0.1 to about 10, incorporating deniers of about 15 to about 250. A wide range of fabric weights may be employed in the wipers of the present invention. Typically, the fabrics used for cleanroom wipers have a weight of about 1 to about 9 ounces per square yard, and more preferably about 3 to about 7 ounces per square yard.

If desired, it is contemplated that the yarn employed in the fabric may be a textured polyester yarn. Such yarns are commercially available and their manufacture is well known to those of skill in the art. Briefly, partially oriented yarn (POY) is modified by crimping, imparting random loops, or otherwise modifying the bulk or surface texture of the yarn to increase cover, absorbency, resilience, abrasion resistance, warmth, insulation and/or to improve aesthetics. A general description of the texturing process may be found in the Encyclopedia of Textiles, Fibers, and Non-woven Fabrics, Encyclopedia Reprint Series, Ed. Martin Grayson, pages 381 – 398, John Wylie and Sons (1984) and Dictionary of Fiber and Textile Technology, Hoechst Celanese (1989). During the texturing process the yarn is preferably not heated above a temperature of 300°F and is generally not heated above about 225°F.

According to one potentially preferred practice of the present invention, once formed, the fabric is preferably subjected to washing and heat setting

procedures as described in U. S. Patent 6,189,189 to Morin et al. (incorporated by reference). In particular, the fabric is preferably dried and heat set at a temperature from about 180 ° F to about 300 ° F and more preferably from 200 ° F to 275 ° F and most preferably from 225 ° F to 265 ° F. The heat set temperature is preferably set at a temperature higher than that which the yarns have previously experienced. Such heat set treatment is believed to improve performance criteria applied to wipers for use in cleanroom environments including sorbency, as well as both the quantity and size of generated particles.

In general, it is desired that cleanroom wipers exhibit high levels of sorbency while generating low levels of particulate contaminants during use. Moreover, it is desired that those particulate contaminants which may be generated have low levels of inorganic ionic constituents such as metallic constituents which may influence the performance of small scale integrated circuitry.

It has been recognized that during use of a wiper, the edges of the wiper may give rise to a disproportionately high level of particulate generation. It is theorized that such disproportionate particulate generation arises from the breaking of fiber elements along the high-energy surfaces at the perimeter edges of the wiper. To alleviate this problem it has been proposed to fuse the borders of the wipers either just along the edge or in a substantially solid fusion zone extending a distance inwardly from the edge towards the interior of the wiper. Such fused zones may be imparted by melting the fibers within the zones by use of energy delivered from a directional heat application